Nov. 5, 1929. S. ROSENZWEIG 1,734,596

ANTIVIBRATION SUPPORT

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Fig. 1.

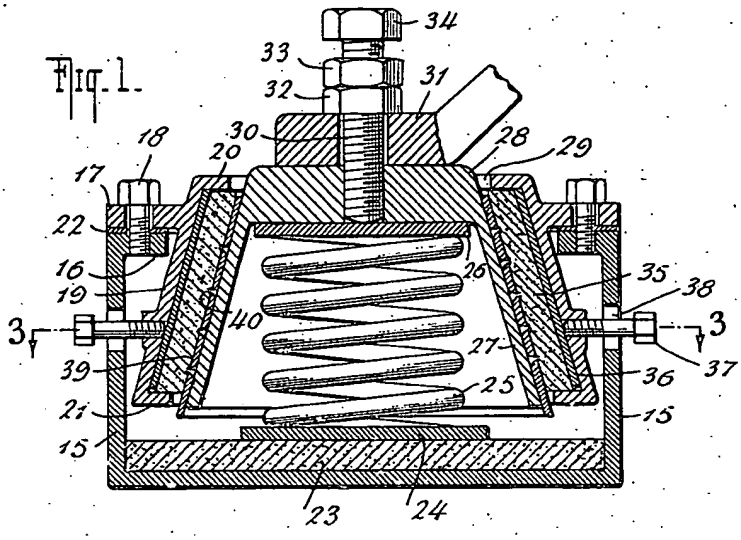

Fig. 2.

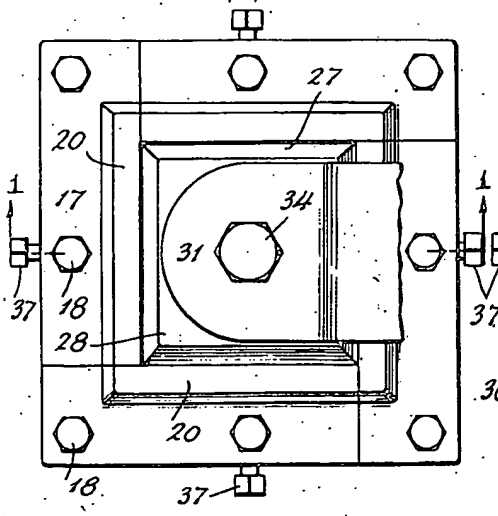

Fig. 3.

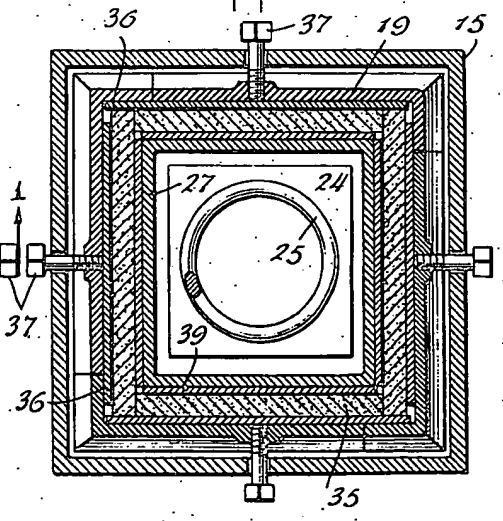

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Fig. 4.

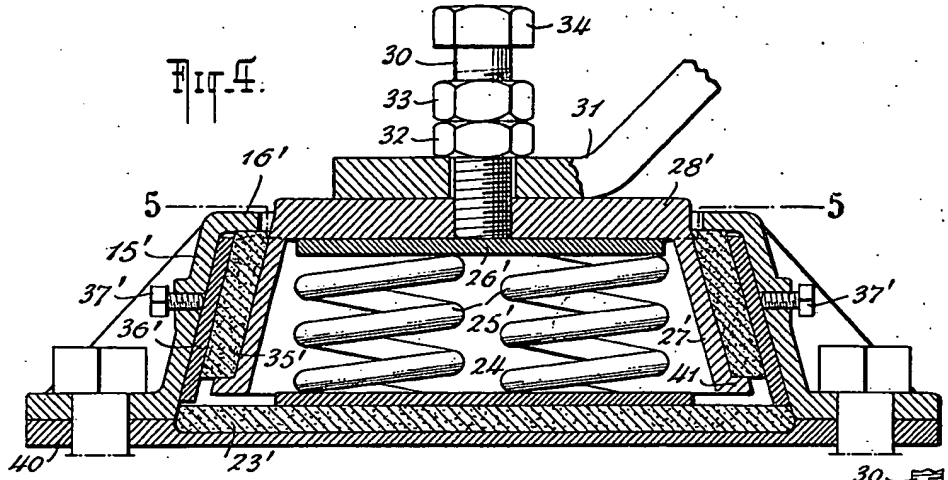


Fig. 5.

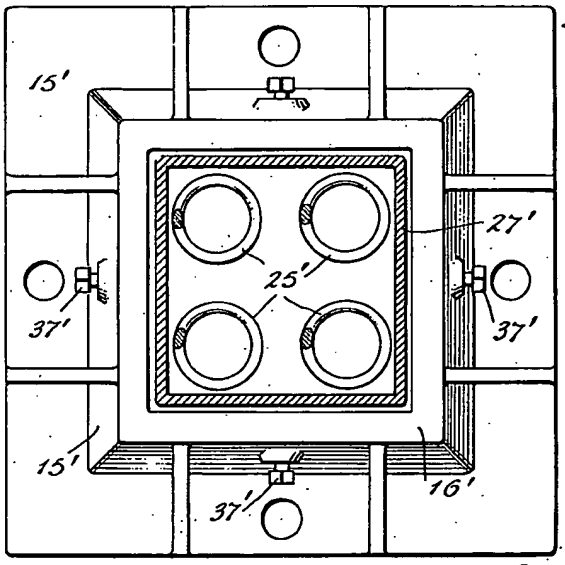


Fig. 6.

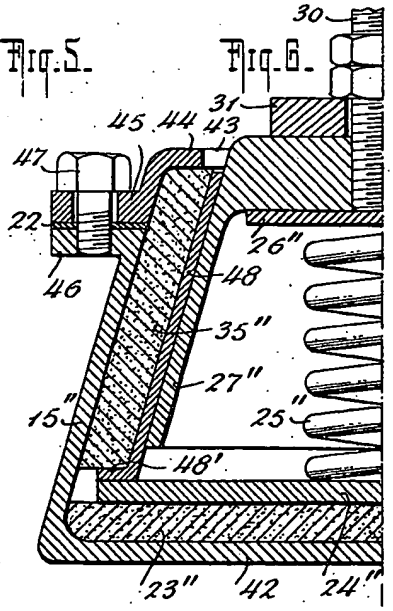
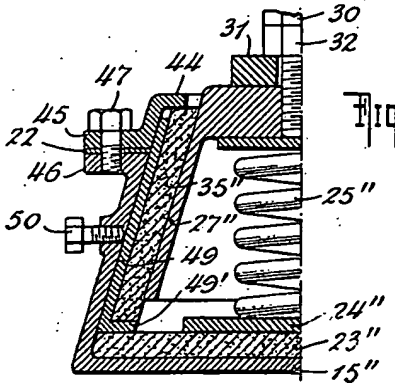


Fig. 7.



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UNITED STATES PATENT OFFICE

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ANTIVIBRATION SUPPORT

Application filed March 4, 1927. Serial No. 172,591.

My invention relates to anti-vibration supports for machinery and the like, and has for its object to provide an efficient construction of this character, in which special facility will be afforded for the adjustment or renewal of certain vibration-absorbing members, and in which excessive wear of said members will be avoided. Other features of my invention will appear from the detailed description following hereinafter.

Several satisfactory examples of my invention are illustrated by the accompanying drawings, in which Fig. 1 is a vertical section, taken on line 1—1 of Fig. 2 and showing one embodiment of an anti-vibration support containing my improvements; Fig. 2 is a plan view of said support; Fig. 3 is a horizontal section on line 3—3 of Fig. 1; Fig. 4 is a view similar to Fig. 1, showing another form of my invention; Fig. 5 is a horizontal section on line 5—5 of Fig. 4; and Figs. 6 and 7 are partial sectional elevations of two additional forms of my invention.

In the form of construction shown in Figs. 1, 2, and 3, the outer housing of the support comprises a body 15 of rectangular or square outline provided at the top with an inwardly-extending flange 16. The upper part of the housing consists of four sides or sections each provided with an outwardly-extending flange 17 adapted to project over the corresponding part of the flange 16 and to be secured thereto by screws 18 passing loosely through the flange 17 and into threaded apertures in the flange 16. Each section also has an inclined portion 19 extending partly above the flange 17, but chiefly downwardly into the interior of the body 15. This inclined portion is provided with inwardly-extending top and bottom flanges 20 and 21 respectively. Between the flanges 16 and 17 I may interpose a strip of packing or distance pieces (shims) 22 for adjusting the interior sections to the proper level relatively to the body 15.

At the bottom of the chamber formed by the body 15 I have shown a sheet or layer 23 of cork or other suitable vibration-absorbing and sound-deadening material, and on this rests a metal plate 24 forming a lower abutment for one or more coiled springs 25. The upper ends of these springs engage an upper abutment plate 26 which, like the main portions of the springs, is contained in the spring casing having inclined portions 27 preferably parallel to the respective portions 19 of the outer housing, or at least inclined in the same general direction (upwardly from left to right at the left-hand portion of Fig. 1). The spring casing is therefore of pyramidal shape, tapering upwardly. The plate-like top 28 of the spring casing projects into the opening 29 left between the inner edges of the flanges 20. The upper abutment plate 26 is engaged by the lower end of a screw 30 fitted into a threaded opening in the top 28 of the spring casing, but extending loosely through a lug or like member 31 on the base of the machine to be supported. Such base is clamped against the top 28 by means of a nut 32, a lock nut 33 preventing accidental loosening of the nut 32. The screw 30 has a head 34 so that, after loosening the nuts 33 and 32, the screw may be turned to adjust the distance between the plate 26 and the top 28 of the spring housing.

Between the outer surface of the spring casing portion 27 and the adjacent inclined portions 19 of the outer housing are placed plates or fillers 35 of cork or other suitable sound-deadening and vibration-absorbing material, in engagement with the flanges 20 and 21 of the outer housing. In this form of my device, the outer surfaces of the fillers 35 do not engage the inner surfaces of the inclined portions 19, but plates 36 or followers of steel or other suitable material are interposed between the fillers and said inclined portions, and these plates are adjustable to press the fillers 35 inwardly more or less, so that there will be no looseness. For this purpose, I have shown adjusting screws 37 threaded into openings of the inclined portions 19 and extending loosely through openings 38 in the body 15 of the outer housing, the outer ends of the screws being thus accessible for turning them, while the inner ends of the screws engage the respective plates or followers 36. The openings 38 are made as vertical slots, to allow the screws to move up or down when the sections 17, 19, 20, 21

are adjusted vertically by means of the screws 18.

Between the plates or fillers 35 and the outer surface of the inclined spring housing portion 27, I have shown linings 39 of steel or other suitable material, preferably provided with projections 40 extending into the adjacent filler, so that the filler and said lining will be compelled to move up or down in unison. These projections may be made by punching holes into the linings 39 and forcing the material at the edges of the holes to one side, as indicated. The linings 39 are interposed for the purpose of allowing the spring casing (in the event of vibrations) to slide on a finished surface instead of the rough surface offered by the fillers 35. If these linings are omitted, rapid wear of the fillers 35 may occur, thus impairing the proper operation of the apparatus. Making the neighboring surfaces of the inclined portions 27 and 19 parallel enables me to make the fillers 35 from sheets or plates of uniform thickness such as are obtainable in the market. Furthermore, when such neighboring surfaces are inclined in the direction shown, whether at the same angle or not, even a slight motion will compress the filler to a much greater extent than when one of such surfaces is vertical and therefore parallel to the line of motion. It will be obvious, for instance, that if the inclined portion 27 moves or tends to move, upwardly, a compressing action will be exerted not only by such surface, but by the inner surface of the adjacent inclined portion 19, which forms an abutment or backing opposing the upward movement of the filler 35.

It will be understood that as a rule there will be a plurality of supports of the character illustrated, in connection with a machine. The screw 30 of each of such supports will be operated to adjust the plate 26 until the spring or springs 25 are under the proper tension with regard to the weight of the machinery and to its up and down vibrations. Downward movements will be checked by the spring or springs 25, and also by the elastic bottom layer 23. Upward movements or vibrations will be taken up by the elastic fillers 35, which are under a certain degree of compression, the springs 25 being adjusted to a tension sufficient to effect such a compression by forcing the spring housing upwardly, even when there are no vibrations, that is, when the machine is not in operation.

If any one of the fillers 35 is to be removed, this can be done readily, without disturbing the body 15 of the outer housing, by removing the inclined section containing such filler, in a direction parallel to the adjacent inclined wall of the spring casing, after previously removing the screw or screws 18 holding said section. These screws also enable me to vary the compression of the fillers 35.

In the form of my invention illustrated by Figs. 4 and 5, the outer housing 15′ is secured by bolts or the like to a base 40. The adjusting screws 37′ engage plates or followers 36′ the lower ends of which are shown as resting on the cork bottom layer 23′. The fillers 35′ are set between the top flange 16′ of the housing 15′ and the outwardly-extending flange 41 at the bottom of the spring casing. While the fillers 35′ are shown in direct contact with the inclined portions 27′ of the spring housing, it will be understood that I might interpose linings such as those indicated at 39 in the form of my invention first described. The interior parts are accessible readily by detaching the housing 15′ from the base 40.

In the construction illustrated by Fig. 6, the outer housing has its inclined lower portion 15″ made integral with the base 42. The upper portion 43 is made with a flange 44 to engage the fillers 35″ and also a flange 45 to co-operate with a flange 46 on the housing 15″ and with bolts 47, in substantially the same manner as in the form of my invention first described. The linings 48 are of the same character as described above, but have outwardly-extending bottom flanges 48′ to engage the fillers 35″. In other respects, this form of my invention is constructed and operates in the same manner as described above.

Finally, in Fig. 7, I have shown still another embodiment, in which the general features are the same as in Fig. 6, but the linings 48 have been omitted, while on the other hand there have been shown followers 49 with screws 50 for adjusting them, said followers differing from those shown in the first form of my invention by the addition of an inwardly-extending bottom flange 49′ engaging the lower end of the filler.

In Figs. 6 and 7, vertical adjustment of the upper portion 43 of the housing, relatively to its lower portion 15″, will alter the compression of the lining 35″ more efficiently than when a similar adjustment is effected in Fig. 1 by means of the screws 18.

It will be understood that the linings and the followers may be employed jointly in the same structure, as exemplified in Figs. 1 to 3, or separately, as in the other forms illustrated. All of the constructions shown enable the individual fillers to be removed and replaced readily, with a minimum of disturbance of other parts. The adjustment of the spring tension is effected without any material change in the level of the inner spring housing and of the machinery resting thereon.

While coiled springs have been illustrated at 25, 25′, and 25″, I desire the term "spring" to be interpreted broadly as covering any suitable form of elastic cushion or support. Specifically, however, the coiled springs have the advantage of permitting considerable adjustment in the direction of their length, and through a wide range of elastic properties.

Various modifications may be made without departing from the nature of my invention as set forth in the appended claims.

I claim:

1. An anti-vibration support comprising an outer housing, a spring casing located within said housing, spring mechanism co-operating with said casing, elastic fillers located between the housing and the casing, followers interposed between the fillers and the housing and means for adjusting said followers transversely to the direction in which the spring mechanism permits the casing to move relatively to said housing.

2. An anti-vibration support comprising an outer housing, a spring-pressed casing located within said housing, elastic fillers located between the housing and the casing, and linings interposed between said fillers and the casing to reduce wear on the fillers, said linings being secured to the adjoining fillers rigidly so as to be immovable relatively thereto.

3. A support according to claim 1, in which there is provided a filler-adjusting mechanism carried by the housing and extending transversely to the major vertical axis of the support into contact with the followers but clear of engagement with the fillers themselves.

4. A support according to claim 2, in which the linings are provided with projections extending into the adjoining fillers to secure or anchor them to such linings.

In testimony whereof I have hereunto set my hand.

SIEGFRIED ROSENZWEIG.